



**LUMINAIRE TESTING LABORATORY, INC.**

SUSTAINING  
MEMBER  
of the  
**IESNA**

905 Harrison Street · Allentown, PA 18103 · 610-770-1044 · Fax 610-770-8912 · www.LuminaireTesting.com

DATE: 02-06-2009

PREPARED FOR: BTF SOLAR LTD  
 CATALOG NUMBER: A19 LED REPLACEMENT LAMP  
 LUMINAIRE: EXTRUDED ALUMINUM AND PLASTIC HEATSINK HOUSING, CLEAR  
 PATTERNED PLASTIC ENCLOSURE.  
 LAMP: ONE LED REPLACEMENT LAMP WITH 5 WHITE LEDS  
 LED POWER SUPPLY: INTEGRAL  
 ELECTRICAL VALUES: 120.0VAC, 0.0967A, 5.86W  
 NOTE: THIS TEST WAS PERFORMED USING THE CALIBRATED PHOTODETECTOR METHOD  
 OF ABSOLUTE PHOTOMETRY.\* VERTICAL TEST DATA WAS ACQUIRED IN 1/2  
 DEGREE INCREMENTS.

**Candela Distribution**

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5	Flux
0	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	
5	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	3.5
15	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	10.3
25	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	16.5
35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	21.7
45	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	25.3
55	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	27.2
65	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	27.6
75	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	24.1
85	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	18.0
90	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	
95	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	8.6
105	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1.9
115	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0.7
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.4
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.2
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.1
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

**Zonal Lumen Summary**

Zone	Lumens	% of Lamp	% of Luminaire
0-30	30.2	N/A	16.2%
0-40	51.9	N/A	27.9%
0-60	104.4	N/A	56.1%
0-90	174.2	N/A	93.5%
90-180	12.1	N/A	6.5%
0-180	186.3	N/A	100.0%

Total lumen Output      186.3 Lumens  
 Luminaire efficacy:      31.8 Lumens per Watt  
 CIE Type:                  Direct  
 Spacing Criterion:        1.48



Approved By: MG

\*DATA WAS ACQUIRED USING THE CALIBRATED PHOTODETECTOR METHOD OF ABSOLUTE PHOTOMETRY. A UDT MODEL #211 PHOTODETECTOR AND UDT MODEL #S370 OPTOMETER COMBINATION WERE USED AS A STANDARD. A SPECTRAL MISMATCH CORRECTION FACTOR WAS EMPLOYED BASED ON THE SPECTRAL RESPONSIVITY OF THE PHOTODETECTOR AND THE SPECTRAL POWER DISTRIBUTION OF THE TEST SUBJECT.

**TESTING WAS PERFORMED IN ACCORDANCE WITH IES LM-79-08.**  
 TEST ANGULAR INCREMENTS AND REPORT FORMATTING WAS BASED ON IES LM-41-98 AND LM-46-04.



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Candela Tabulation (5 degree Vertical Increments)

	0	22.5	45	67.5	90	112.5	135	157.5	180	202.5	225	247.5	270	292.5	315	337.5
0	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
5	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36	36
10	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
15	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37	37
20	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
25	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38	38
30	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35	35
40	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
45	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33	33
50	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32	32
55	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30	30
60	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29	29
65	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28	28
70	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26	26
75	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
80	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19	19
85	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17
90	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
95	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
100	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
105	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
110	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
115	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
120	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
125	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
130	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
135	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
150	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
155	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
160	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
165	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
170	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
175	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
180	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Zonal Lumen Tabulation (5 degree zones)

Zone	Lumens	Zone	Lumens	Zone	Lumens	Zone	Lumens
0-5	0.9	45-50	13.0	90-95	5.7	135-140	0.1
5-10	2.8	50-55	13.5	95-100	2.9	140-145	0.1
10-15	4.3	55-60	13.7	100-105	1.3	145-150	0.1
15-20	6.0	60-65	13.8	105-110	0.6	150-155	0.0
20-25	7.5	65-70	13.8	110-115	0.4	155-160	0.0
25-30	8.9	70-75	12.8	115-120	0.3	160-165	0.0
30-35	10.3	75-80	11.3	120-125	0.2	165-170	0.0
35-40	11.4	80-85	9.8	125-130	0.2	170-175	0.0
40-45	12.3	85-90	8.2	130-135	0.1	175-180	0.0



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Utilization of Lumens - Zonal Cavity Method												
Effective Floor Cavity Reflectance 20%												
Ceiling Cavity Reflectance	90				80				70			
Wall Reflectance	70	50	30	10	70	50	30	10	70	50	30	10
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **											
0	225.7	225.7	225.7	225.7	218.9	218.9	218.9	218.9	212.4	212.4	212.4	212.4
1	198.4	184.6	172.4	161.4	191.3	178.8	167.5	157.5	184.5	173.1	162.9	153.7
2	177.2	155.7	138.1	123.4	170.3	150.7	134.5	120.9	163.7	145.9	131.1	118.4
3	159.6	133.6	113.7	98.1	153.1	129.3	111	96.33	146.9	125.3	108.3	94.59
4	144.8	116.3	95.8	80.34	138.8	112.7	93.62	79.03	133.1	109.3	91.49	77.75
5	132.2	102.5	82.18	67.35	126.7	99.47	80.42	66.35	121.6	96.53	78.7	65.38
6	121.4	91.32	71.54	57.53	116.4	88.71	70.1	56.74	111.8	86.18	68.68	55.96
7	112	82.07	63.05	49.9	107.5	79.81	61.85	49.26	103.3	77.64	60.67	48.62
8	103.8	74.33	56.16	43.83	99.79	72.38	55.14	43.3	95.98	70.49	54.15	42.77
9	96.64	67.79	50.47	38.92	93	66.09	49.61	38.47	89.56	64.44	48.76	38.03
10	90.32	62.2	45.72	34.88	87.02	60.72	44.98	34.5	83.91	59.27	44.24	34.12

  

Ceiling Cavity Reflectance	50				30			10			0
Wall Reflectance	70	50	30	10	50	30	10	50	30	10	0
Room Cavity Ratio (RCR)	** Values are expressed as Lumens delivered to the task surface **										
0	200.3	200.3	200.3	200.3	189.2	189.2	189.2	179	179	179	174.2
1	171.9	162.6	154.2	146.4	153	146	139.7	144	138.5	133.3	128
2	151.6	136.9	124.5	113.7	128.7	118.3	109.1	121	112.4	104.8	99.45
3	135.6	117.6	103.1	91.22	110.5	98.27	87.96	104	93.66	84.82	79.61
4	122.7	102.7	87.39	75.24	96.68	83.48	72.8	91.05	79.76	70.42	65.42
5	112.1	90.96	75.37	63.42	85.77	72.19	61.53	80.92	69.14	59.67	54.91
6	103.2	81.39	65.94	54.41	76.92	63.3	52.89	72.74	60.76	51.4	46.9
7	95.57	73.5	58.37	47.36	69.62	56.16	46.11	65.98	54.02	44.89	40.64
8	88.98	66.9	52.2	41.72	63.52	50.33	40.69	60.34	48.51	39.67	35.66
9	83.21	61.3	47.1	37.14	58.34	45.49	36.27	55.55	43.93	35.41	31.63
10	78.15	56.51	42.81	33.36	53.9	41.43	32.62	51.44	40.08	31.88	28.31

Average Luminance Table (cd/m<sup>2</sup>)

	0	45	90
0	13911	13911	13911
45	18093	18093	18093
55	24664	24664	24664
65	25543	25543	25543
75	24832	24832	24832
85	23198	23198	23198

THIS TEST WAS CONDUCTED USING PHOTOMETRY TECHNIQUES ACCORDING TO STANDARD IES PROCEDURES. THE USER MUST THEREFORE USE CAUTION IN THE FOLLOWING SITUATIONS: 1) THIS TEST WAS PERFORMED USING A SPECIFIC BALLAST/LAMP COMBINATION. EXTRAPOLATION OF THESE DATA FOR OTHER BALLAST/LAMP COMBINATIONS MAY PRODUCE ERRONEOUS RESULTS. 2) THIS TEST WAS CONDUCTED IN A CONTROLLED LABORATORY ENVIRONMENT WHERE THE AMBIENT TEMPERATURE WAS HELD AT 25°C ±1°C. FIELD PERFORMANCE MAY DIFFER PARTICULARLY IN REGARDS TO CHANGE IN LUMINOUS OUTPUT AS A RESULT OF DIFFERENCE IN AMBIENT TEMPERATURE AND METHOD OF MOUNTING THE LUMINAIRE.



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